Math 3C   Fall 2014
Pre-lecture 2-1 Due: Beginning of lecture-Monday, October 13.

This is to be done on your own paper. Please write your name (last name first) on the top right corner along with your discussion section number (B02, B03 etc) and "pre-lecture [number]" (in this case "pre-lecture 2-1").

This will be graded on effort and thoughtfulness, not on correctness. With that said, do not feel obligated to write more than necessary. This is intended for you to work on your own.

1. Draw a coordinate plane going from -8 to 8 on both axes. On this coordinate plane, with the help of a calculator or by plotting some points:

    (a) Draw the graph of the function $f_1(x) = x^2$. (I am going to use numbers to subscript the functions so I do not have to think of too many different letters)

    (b) Draw the graph of the funtion $f_2(x) = x^2 + 4$

    (c) Draw the graph of the function $f_3(x) = x^2 - 2$

    What do you notice about these three different graphs?

    If a is some number, what do you think the graph of $f_4(x) = x^2 + a$ will look like compared to $f_1(x)$?

2. Draw a new coordinate plane going from -8 to 8 on both axes. On this coordinate plane, with the help of a calculator or by plotting some points:

    (a) Draw the graph of the function $g_1(x) = x^2 + 2$

    (b) Draw the graph of the function $g_2(x) = x^2 + 6x + 11$

    (c) Draw the graph of the function $g_3(x) = x^2 - 8x + 18$
    What do you notice about these three different graphs?
    Now use the "completing the square" technique on $g_2(x)$ (on $x^2 + 6x + 11$) and on $g_3(x)$ (on $x^2 - 8x + 18$) to rewrite these functions into a different form.
    Now compare what these functions now look like and look at their graphs. If a is some number, what do you think the graph of $g_4(x) = (x + a)^2 + 2$ will look like compared to the graph of $g_1(x)$?

3. Draw a new coordinate plane going from -8 to 8 on both axes. On this coordinate plane, with the help of a calculator or by plotting some points:

    (a) Draw the graph of the function $h_1(x) = x^3$

    (b) Draw the graph of the function $h_2(x) = (x - 2)^3 + 1$

    (c) Draw the graph of the function $h_3(x) = (x + 1)^3 - 1$
    What do you notice when you compare these three graphs?

4. Pretend you have a picture of the graph of the function $k_1(x) = x^{15} + 2$. What do you think the graph of the function $k_2(x) = (x - 3)^{15} + 4$ would look like when compared to the graph of $k_1(x)$?

5. Pretend you have a picture of the graph of the function $k_3(x)$ (this time I'm not telling you what the function $k_3(x)$ is). What do you think the graph of the function $k_4(x) = k_3(x - 4) + 3$ would look like when compared to the graph fo the function $k_3(x)$?